

Magnetic Torque Coupler Retrofit Kit Installation Manual

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Important

All information and technical specifications in this document have been carefully checked and compiled by the author; however, we cannot completely exclude the possibility of errors. TechnipFMC is always grateful to be informed of any errors; contact us at TechnipFMC.com.

Caution

The default or operating values used in this document and in the configuration parameters of the Magnetic Torque Coupler are for factory testing only and should not be construed as default or operating values for your metering system. Each metering system is unique and each configuration parameter must be reviewed and programmed for that specific metering system application.

Disclaimer

TechnipFMC hereby disclaims all responsibility for damages, including but not included to consequential damages arising out of or related to the inputting of incorrect or improper program or default values entered in connection with the Magnetic Torque Coupler.

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System installation supervision, startup, and commissioning services are available.

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Literature Library

http://info.smithmeter.com/literature/online_index.html

1 Overview

The Smith Meter® Magnetic Torque Coupler (MTC) is designed to replace the packing gland of your existing or new Smith Meter double-case PD meter. It supports all of the current mechanical and electronic stack-up options, meter sizes, and mechanical gear ratios.

The MTC retrofit kits are designed for the following PD meters:

Meter Model	Pressure Rating
C2	S3, S5, S6, and S7
F4	S3, S5, S6, and S7
G6	S3, S5, S6, and S7
H8	S3, S5, S6, and S7
M16	S3, S5, and S6
K12	S1, S3, S5, S6, and S7
JA10	S1, S3, S5, S6, and S7
JB10	S1, S3, S5, S6, and S7

1.1 Included in Retrofit Kits

The parts included in a MTC retrofit kit are dependent on the type of meter. For a list of the parts included in each meter, see [Magnetic Torque Coupler Retrofit Kit Parts List \(PO01220\)](#).

1.2 Required Tools

The following tools are needed to install the MTC retrofit kit:

- O-ring lubricant, such as Dupont Molykote 55
- Torque wrench
- Ratchet or drill with appropriate fittings or appropriately sized Allen wrenches (hex keys)
- Snap ring pliers, if necessary
- Needle-nose pliers

1.3 Receipt of Equipment

When you receive your MTC retrofit kit, you should check the exterior packing case for any shipping damage.

If the packing case is damaged, contact the shipping carrier immediately regarding their liability.

Carefully remove the unit from the exterior packing case and inspect it for damaged or missing parts. Ensure that all necessary parts are included.

Prior to installation, the unit should be stored in its original packing case and protected from adverse weather conditions and abuse.

If the MTC retrofit kit is damaged or parts are missing, a written report must be submitted to:

TechnipFMC
c/o Inside Sales Department, Measurement & Production Solutions PO Box 10428
Erie, PA 16514

1.4 Storage Instructions

To ensure your MTC retrofit kit is not corroded or damaged by moisture or water before being installed, it must be properly stored using the following instructions:

- Keep the unit in a dry, protected location.
- Avoid storing the unit outside; if you must store it outside, ensure it is protected from the elements.

1.5 Warnings and Precautions

Before you begin, please read all of the following warnings and cautions, as well as the full manual, to reduce the risk of injury, equipment damage, or malfunction.

1.5.1 Hazardous Locations

Due to the high strength magnets used in the construction of the MTC, the outer housing will have some magnetic attraction to ferrous materials, tools, and other metal

objects. Ensure that the MTC is placed in an area where it will not attract metal contaminants.

1.5.2 Personal Medical Device Hazards

Medical devices, such as pacemakers, hearing aids, and other implanted medical devices could be affected by the high-strength magnets in the MTC.

1.5.3 Disassembly

Do not attempt to disassemble the MTC as the unit is not serviceable.

2 Installation Instructions

The following installation instructions apply to the MTC retrofit kit. You should read these instructions carefully before beginning the installation.

The installation instructions below include the following two main procedures:

- Removing the existing packing gland
- Installing the MTC retrofit kit

2.1 Removing the Packing Gland

In case an installation problem occurs and you need to return the meter into service, you should keep the packing gland.

Complete the following steps to safely remove the existing packing gland from the meter:

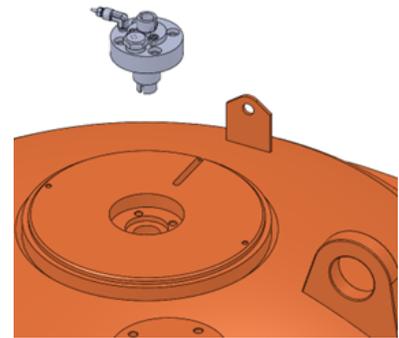
1. Safely prepare the meter for servicing following your company's policies and procedures prior to removing the packing gland assembly, as follows:
 - a. Stop flow to the meter.
 - b. Isolate the meter so product and pressure cannot enter the meter.
 - c. Depressurize the meter to remove any pressure in the meter to 0 pound-force per square inch (psi).
 - d. Drain the fluid from the meter below the meter's cover to a safe level so the removal of the packing gland and the MTC retrofit kit can be installed safely.

CAUTION: Before proceeding, verify that the meter is safe to remove the packing gland and install the MTC kit, and all pressure has been removed from the meter.

2. Disconnect and remove any pulse output devices (such as the Universal Pulse Transmitter (UPT) or Photoelectric Pulse Transmitter (PEXP)) and mechanical output counters.
3. Remove the dome adapter from the meter cover to access the packing gland.
4. Remove the bolts attaching the packing gland to the meter cover.

5. Pull the packing gland straight up and out from the cover.
6. Remove the o-ring or flat gasket seal from the top of the meter cover, if it is still in place.
7. Thoroughly clean the surface area where the original packing gland was seated on the meter cover.

Figure 1: Remove Packing Gland



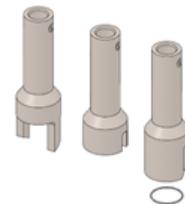
2.2 Installing the MTC Retrofit Kit

Complete the following steps to install the MTC retrofit kit. Refer to the Magnetic Torque Coupler Retrofit Kit Parts List ([PO01220](#)) for diagrams corresponding to your meter.

1. Ensure you have the MTC retrofit kit required for your meter and pressure rating.
2. Remove all of the parts from the MTC retrofit kit's shipping box and lay them out on a clean surface.
3. Determine the type of input coupling needed for the MTC:

- Fork style
- Cup style without snap ring
- Cup style with snap ring

Figure 2: Input Coupling Style



If your MTC retrofit kit includes the cup style with snap ring input coupling, you must remove the internal coupling shaft from inside the meter using long needle-nose pliers to grasp it and pull it straight up and out of the meter. You must install the internal coupling shaft to the MTC (see step 6 below for instructions).

Figure 3: Internal Coupling Shaft



4. Lubricate all provided o-rings with Dupont Molykote 55 or similar o-ring lubricant.

5. Install the MTC adapter assembly on to the meter's cover where the original packing gland was removed, as follows:
 - a. Use the assembly diagram provided in the Magnetic Torque Coupler Retrofit Kit Parts List ([PO01220](#)).
 - b. Rotate the lower adapter until the mounting holes align with the existing tapped holes on the meter cover.
 - c. Torque the fasteners in a criss-cross pattern to the values listed in the torque table. See the fastener sizes listed in the Magnetic Torque Coupler Retrofit Kit Parts List ([PO01220](#)).

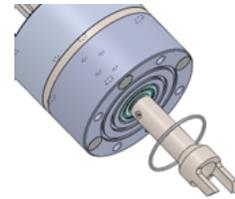
6. If you are working with the cup style with a snap ring, install the internal coupling shaft into the MTC input coupling and secure it in position with the snap ring. View and note the orientation of the shaft pins or engagement slots when reassembling.

Figure 4: Cup Styles with Snap Ring Input Coupling



7. Place an o-ring from the adapter assembly into the inside o-ring groove on the underside of the MTC.
8. Install the MTC onto the adapter assembly using the following steps:

Figure 5: O-Ring Installation



- a. If possible, look through the hole in the meter cover to view and note the orientation of the coupling inside the meter to facilitate the alignment of the MTC input coupling.
- b. Slowly lower the MTC through the adapter so the input coupling engages with the internal coupling shaft inside the meter.

Do not force the MTC into place.

- c. If the MTC has the cup style with snap ring, do the following steps:
 - i. Lower the MTC into place with the attached internal meter coupling shaft.
 - ii. Slowly rotate the output coupling on top of the MTC, feeling for engagement with the internal meter coupling. When the input coupling on the MTC is

properly engaged with the coupling inside the meter, the MTC will sit flat on the MTC adapter.

- d. Rotate the body of the MTC so the counterbored holes through the MTC align with the tapped holes in the MTC adapter assembly.
 - e. Install the four 1/4-20 x 2-3/8" socket head cap screws through the mounting holes in the MTC.
 - f. Tighten the fasteners in a criss-cross pattern in small increments to seat the o-ring.
 - g. Torque the fasteners to the final values [section 2.3: Torque Values on the next page](#).
9. Before installing the MTC riser, dome adapter, and output devices, fill and pressurize the meter to check for leaks.

Follow your company's policies and procedures for meter start-up or use the Single and Double-Case PD Meters Installation, Operation, and Maintenance Manual's ([MN01011](#)) start-up procedure instructions, for assistance with bleeding air from the meter and filling the system with fluid.

As pressure increases inside the meter, carefully inspect around the meter for fluid leaks. If any leaks are found, immediately stop filling the meter and depressurize the meter. Determine where the leak occurred and correct it, if possible. If a leak occurred on the body of the MTC, remove and return the original packing gland into service and then send the MTC to TechnipFMC. If a leak occurred at the adapter plates, remove and check that the mating surfaces on the meter are clean, smooth, and free of debris. Disassemble the adapter assembly and verify the o-rings are properly installed and the mating surfaces are clean, smooth, and free of debris. Reassemble the adapter assembly and follow the assembly procedure and torque values outlined in this document to complete the MTC retrofit kit assembly, and then repeat step 9. If the leak persists, remove the MTC and adapter assembly and return the packing gland to service. Send the MTC and adapter assembly to TechnipFMC.

10. Install the MTC riser by aligning the MTC spacer ring on the meter cover where the existing dome adapter is mounted.
11. Carefully lower the dome adapter with the pulse output device (or mechanical counter) onto the MTC riser.
12. Align the input coupling on the pulse output device (or mechanical counter) to the position at which the MTC output coupling is oriented. This makes the engagement

of the coupling possible.

Do not force the couplings together. Ensure they are aligned for engagement.

13. With the dome adapter in place, rotate it to align the bolt mounting holes with the tapped holes in the meter cover.
14. Install the long bolts supplied with the retrofit kit through the dome adapter mounting holes into the meter cover.
15. Torque the fasteners to the final values listed in [section 2.3: Torque Values below](#).
16. Reinstall any remaining output devices in the order in which they were removed.
17. Begin meter operation and verify the pulse output following your companies policies and procedures for meter start-up or use the Single and Double-Case PD Meters Installation, Operation, and Maintenance Manual's ([MN01011](#)) start-up procedure instructions for assistance.
18. Prove the meter as required and return it to service.

2.3 Torque Values

The following torque values should be used for the MTC kit's fasteners:

Bolt Size	Tightening Torque (Dry)
10-32 x 7/16"	28 to 30 inch-pounds (in•lb)
1/4-20 x 2-3/8"	10 to 12 foot-pounds (ft•lb)
5/16-18 x 3/8"	12 to 14 ft•lb
5/16-18 x 5/8"	
5/16-18 x 1-3/8"	
5/16-18 x 3-3/4"	
5/16-18 x 4"	
5/16-18 x 4-1/4"	30 to 32 ft•lb
5/16-18 x 5"	
7/16-14 x 3/4"	

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